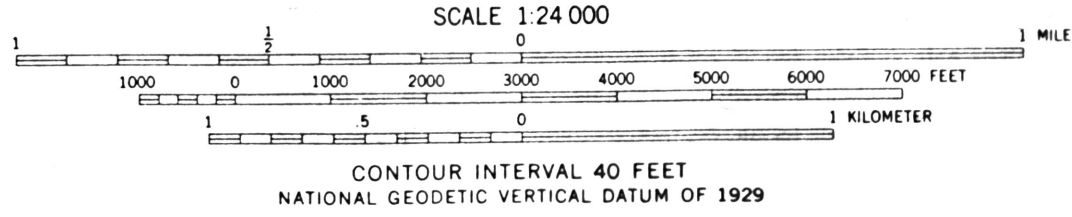
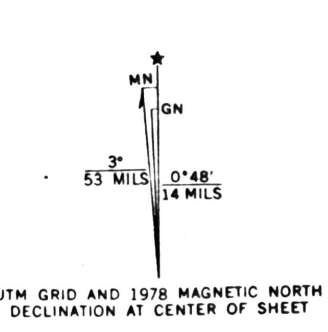


Maped, edited, and published by the Geological Survey
in cooperation with Kentucky Geological Survey
and West Virginia agencies

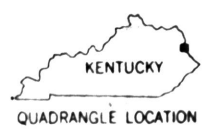
Control by USGS, USCG&S, and USCE

Topography in Kentucky by photogrammetric methods from aerial
photographs taken 1951. Field checked 1954. Revised 1964
Topography in West Virginia by photogrammetric methods from aerial
photographs taken 1958. Field checked 1964

Polyconic projection. 1927 North American datum
10,000-foot grids based on Kentucky coordinate system, south zone
and West Virginia coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks,
zone 17, shown in blue



ROAD CLASSIFICATION
Heavy-duty ——— Light duty ———
Medium-duty ——— Unimproved dirt ———
U.S. Route ——— State Route ———



WILLIAMSON, W. VA.-KY.
NE 4 WILLIAMSON 15' QUADRANGLE
N3737.5-W8215.7.5
1964
PHOTOREVISED 1978

Landslides and related features interpreted
from aerial photographs:

1:60,000 (black and white) 1959
1:40,000 (black and white) 1974

Photointerpretation and field check 1977,8
This report is preliminary and has not
been reviewed for conformity with U. S.
Geological Survey editorial standards.
Data on location of strip mines in part from:

Alvord, Donald C. and Trent, Virgil A., 1962,
Geology of the Williamson quadrangle in Kentucky;
U. S. Geological Survey Geologic Quadrangle Map
GQ-187, scale 1:24,000.

LANDSLIDES AND RELATED FEATURES

OF THE WILLIAMSON, W. VA. - KY. QUADRANGLE

by
William F. Outerbridge
1982

U.S. Geological Survey

OPEN FILE MAP 82-51 (F-14)



ACTIVE OR RECENTLY ACTIVE LANDSLIDE

Complex landslide composed of earthflow, debris
slide, earth and rock slump. Identified from
historical records, and from scars, debris and
other field evidence. Ground extremely unstable;
sliding accelerated by excavation, loading and
changes in drainage conditions. May include
areas with several active slides too small to
be shown separately. Questioned where doubtful.



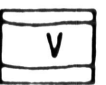
OLD LANDSLIDE

Area of extensive hummocky ground caused by
earthflow and earth and rock slump. Lacks
clear evidence of active sliding. Relatively
stable in natural, undisturbed state,
generally not affected by small structures properly
sited in areas away from the edge of the toe;
can be reactivated by extensive, rapid exca-
vation, loading, and changes in ground water and
surface water conditions. Area of old landslide
probably includes recent ones not identified
from field evidence or otherwise documented.
Upslope boundary of landslide generally defined
by modified scarp, but downslope (toe) may be
gradational and not well defined. Questioned
where doubtful.



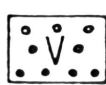
COMBINATION LANDSLIDE

Area of recent and old slides in which
individual slides are not identified.



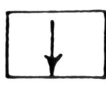
COLLUVIAL SLOPE

Valley wall along major streams with slope as
steep as 40° (85%); stony, clayey silt soil up
to 50 ft. (15 m) thick; commonly buttressed by
a terrace or bench at the toe of the slope; very
susceptible to sliding by cutting of toe area,
removal of terrace or bench, and overloading;
slide commonly activated without apparent cause.



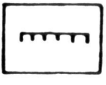
COLLUVIAL SLOPES WITH LANDSLIDES

Landslides too small or obscure to map
individually.



AREAS SUSCEPTIBLE TO DEBRIS FLOWS AND DEBRIS AVALANCHES

Primarily shallow, narrow ravines and chutes with
accumulation of stony colluvium generally 10 ft.
(3 m) or less in thickness; susceptible to rapid
movement during intense rainfall. Most ravines
and chutes designated show evidence of former
debris flows and avalanches. Symbol & desig-
nates historical debris flow or debris avalanche.



AREAS SUSCEPTIBLE TO ROCKFALL

Steep, locally vertical, natural and man-made
slopes and cliffs, 15 ft. (4.5 m) or more high;
formed dominantly of sandstone, limestone, sandy
shale, mudstone and claystone. Interbedded mud-
stone, claystone and shale weather rapidly leaving
sandstone and limestone rock faces unsupported.



SOIL AND ROCK SUSCEPTIBLE TO LANDSLIDING

Soil and rock similar to that involved in land-
slides elsewhere in map area; primarily areas
underlain by claystone, mudstone and shale
associated with other rock types. Rock weathers
rapidly on exposure forming clayey soil highly
susceptible to sliding. Includes coves (U-shaped,
shallow valleys) containing thick layers of clayey
soil that are very susceptible to sliding where
excavation breaks continuity of slope and where
overloaded by artificial fill.

AREAS LEAST PRONE TO LANDSLIDES

Map areas in which no patterns or symbols are shown;
primarily valley floors, ridge tops and broad
benches; modification by excavation and fill may
lead to local landslides.

NOTE

Information shown is intended as a
general guide to ground conditions as of
the date of field check. Additional
landslides and rockfalls should be anticipated
in all map units. The map unit depicts
the dominant condition in the area delineated
and variations in slope stability may occur
at any point in the unit. This map is suit-
able for general planning purposes and as a
supplement to more detailed studies for site
selection. The map cannot be used as a sub-
stitute for detailed geologic and engineering
investigations to establish design and
construction criteria of specific sites.
Some symbols may not appear on this map
because the description is applicable to a
series of maps.

MAN-MADE FEATURES

Strip mines (combination of letter symbols
indicates complex formed of more than one
type of strip mine)

sh bench with high wall
sf furrowed with high wall
sd multiple furrows and multiple benches
ss hilltop removed
srg reclaimed by grading
sru reclaimed by secondary use
sh/r regraded in part, high wall
remains

Coal refuse banks
r identified on aerial photographs;
not classified in field check

rb not burnt nor on fire
rbb burnt
rbd burning
rbs sludge

Quarries
q quarry site
qub spoil bank, quarry waste

Gravel pits
g site of gravel pit

Slides in man-made features
af earth flow in fill
a/s earth flow in strip castings
a/r earth flow in coal refuse
JENKINS 1"x2" SHEET

The first four digits of the open file number designate the
specific 1:250,000 scale map sheet of which this quadrangle
is a part. The last two digits designate the position of the
quadrangle in a subdivision of the 1:250,000 scale map based
on rows and tiers shown in the diagram to the right. The
location of this quadrangle is shown by the black square.

